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Research Article

Supply Chain Capabilities, Operational Constraints, and Performance in Bangladesh's Textile Retail Sector: A Mixed-Methods Investigation

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Abstract

The management practices, problems and improvement pathways of textile retail supply chains in Bangladesh are not well documented, as they link millions of consumers with the manufacturers, wholesalers and importers. To fill this void, this study examines the practices of SCM, capability factors and operational constraints in domestic textile retail sector in Bangladesh. A concurrent mixed methods design was used. A quantitative survey was conducted on 422 textile retail outlets with different sizes, areas and product specializations. Descriptive statistics, reliability analysis, Pearson correlation, multiple regression, independent-samples t-tests, and one-way ANOVA were used. Twenty-two semi-structured key informant interviews (KIIs) were conducted with retailers, suppliers, wholesalers, logistics actors, technology providers and institutional stakeholders, and analyzed using thematic analysis (Braun and Clarke, 2006). Existing SCM practices and operational constraints were the two most significant predictors of SCM outcomes ($\beta = 0.278$, $p < 0.001$ and $\beta = -0.295$, $p < 0.001$, respectively). Each of the three capabilities – inventory planning capability, supplier relationship capability, and technology-enabled capability – made positive contributions. Results were significantly different between small and large businesses, and between experienced and inexperienced businesses, but were not different between product categories. Ten themes emerged qualitatively, indicating that the structural characteristics of the sector are seasonal demand cycles, informal supplier relationships, memory-based inventory systems and organizational readiness deficits. Operational constraints are systemic and are co-produced by actors in the supply chain, and need to be addressed collectively rather than individually at the level of the firm. Relationships with suppliers are a form of resilience capital that is underutilized. Inventory planning is the area of the sector with the highest consequence and lowest development. A sequenced approach of basic inventory discipline, structured supplier collaboration, incremental digitalization and enabling institutional support is needed to modernize the supply chain sustainably. The results provide a focus for the SCM literature to move away from the export-oriented garment industry in Bangladesh and towards the comparatively under-researched retail textile industry.

Keywords

Supply Chain Management, Textile Retail Business; Inventory Planning Capability, Supplier Relationship, Technology Adoption, Bangladesh.

1. Introduction

Supply Chain Management has become a key factor in the competitiveness of retail stores in the international textile and apparel industry. The efficiency of supply chain systems is becoming a key determinant of high-performing companies and those that are struggling to maintain market share as consumer expectations for product availability, price, variety, and delivery speed continue to rise (Imran et al., 2024; Taplin, 2014). In the context of textile retail, the supply chain involves a series of interconnected activities, including sourcing, purchasing, storage, inventory management, transportation, distribution, merchandising, and customer service, all of which impact the retail operation's costs, service levels, and overall sustainability (Islam et al., 2022; Pranta et al., 2025). The efficiency of these interrelated activities, as Taplin (2014) points out, is correlated with the rationalization of the supply chain and the enhancement of channel integration, which compels all players in the retail chain to respond to cost, quality and delivery demands.

Bangladesh is in a paradoxical situation in the field of scholarship on the global textile supply chain. It is a leading exporter of ready-made garments (RMG) in the world, and its export-oriented RMG sector has garnered significant research interest due to the availability of cheap labour, mass production, and being a part of global buyer-driven value chains (Chowdhury et al., 2020; Uddin et al., 2023). Bangladesh is known as one of the leading exporters of textile and clothing in the world, where low labor cost, high quality workforce, and reliable export supply chain help in maintaining its global position (Pranta et al., 2025). However, the domestic textile retail industry, which connects the textile manufacturers, wholesalers, importers, and ultimate consumers in the domestic market, has been investigated less despite employing a significant number of people and being the main channel for reaching millions of consumers in Bangladesh with clothing and fabric products (Bari & Jin, 2021; Haider, 2022).

This is a significant research gap. The retail sector of domestic textile industry is operating in a completely different supply chain landscape compared to the export industry, where the supply chain is informal, the demand cycle is festival-driven, suppliers provide credit facilities, stocks are managed manually, and technology adoption is uneven (Chowdhury et al., 2020; Tumpa et al., 2019). The COVID-19 pandemic highlighted the vulnerability of these systems worldwide, with lockdowns and restricted access to retail outlets causing significant consumption declines, resulting in issues of product surplus, reduced sales, and disposal of unused products (Filho et al., 2022). The Eid season shortage of stock, the post-wedding season surplus of stock, delay in getting stock from wholesaler and transportation costs are recurring challenges in the formal supply chain that have not been adequately addressed in the retail context in the domestic market of Bangladesh.

Demand-side attributes add to the complexity of the textile retail sector's supply chain dynamics. In Bangladesh textile retail market, consumers are more aware and quicker to change their fashion, they shop more frequently and easily get rid of the out-of-fashion items when they are cheap (Taplin, 2014). This increased consumer dynamism increases the uncertainty of demand and puts increased performance pressure on retailers' supply chain systems. At the same time, the capacity to handle large amounts of demand data from retail supply chains can enhance the demand forecasting of clothing products, which can make the retailers more assertive in deciding the volume of procurement (Marquesone & Carvalho, 2022) - a capacity which is not much developed in the domestic retail context of Bangladesh.

There are a number of theoretical approaches that are pertinent to these dynamics. According to Supply Chain Management Theory, sourcing, procurement, inventory, and logistics are interdependent functions that need to be managed strategically as opposed to being managed in isolation as an operational function (Manik, 2022). Relational View Theory is based on the idea that inter-firm relationships (such as supplier trust, long-term coordination, and credit arrangements) create competitive advantages that cannot be achieved by internal resources alone (Bruce & Daly, 2006). Lean-Agile Supply Chain Theory deals with the problem of trying to reduce waste and at the same time be responsive to the volatility of the demand, especially in a market where the demand for basic clothing is predictable and the demand for fashion clothing is volatile due to festivals (Bruce et al., 2004). The Technology-Organization-Environment (TOE) Framework considers the patterns of technology adoption as a result of technological characteristics, organizational readiness, and environmental pressures (Tornatzky & Fleischer, 1990), and Dynamic Capabilities Theory emphasizes the firm's capability to sense, seize, and reconfigure their operational processes in response to the changing market conditions (Das & Hassan, 2021).

In this theoretical and empirical context, the present study aims to investigate the SCM practices in the textile retail businesses in Bangladesh by setting four research objectives: (1) To examine the existing SCM practices including sourcing,

purchasing, storage, inventory control and product delivery; (2) To identify the major challenges faced by the textile retailers such as supply delay, stock out, excess stock, increasing cost, and poor supplier coordination; (3) To assess the role of supplier relationship, inventory planning and technology use in enhancing the efficiency of textile retailers; and (4) To explore strategic opportunities to make textile retail supply chains more efficient, flexible, cost-effective and customer-oriented.

The study is a concurrent mixed-methods design, which includes a quantitative survey of 422 textile retail businesses in Bangladesh and qualitative analysis of 22 key informant interviews with retailers, suppliers, wholesalers, logistics actors, market association representatives, technology service providers and business support stakeholders. This methodological mix allows for statistical generalization and contextual explanation, yielding both empirically derived and practically actionable results. The article adds to the literature on SCM by systematically documenting the evidence from a relatively less studied part of Bangladesh's textile sector, and to practitioners by outlining contextually relevant and resource-efficient improvement pathways available to small, medium and large retail businesses.

2. Literature Review

2.1. Conceptual Foundations of Supply Chain Management

Supply Chain Management is no longer a mere logistics-centric approach, but rather a holistic strategic management that includes procurement, supplier management, inventory management, warehousing, transportation, information management, and customer relationship management (CRM) (Das & Hassan, 2021; Manik, 2022; Uddin & Akhter, 2019). Manik (2022) views SCM as a systematic and strategic management of traditional business functions across and within firms to enhance the long-term performance of each firm and the supply chain as a whole, noting that supply chains are not just linear product-moving systems but are networks of coordinated decisions, relationships, and value flows. The strategic value of SCM is the impact it has on cost reduction, operational efficiency, responsiveness, customer satisfaction, and competitive advantage.

In textile and apparel industries, the supply chain includes the fiber production, spinning, weaving, finishing, manufacturing, wholesale and retailing processes, which are geographically distributed (Lam & Postle, 2006; Şen, 2008). The fashion and textile retail environment is also unique in terms of the short life cycles of products, high levels of product variety, frequent changes in trends and strong seasonality, which make demand forecasting more challenging and inventory management more critical (McMaster et al., 2020). Lean supply chains are appropriate for simple and predictable products, and agile supply chains are appropriate for fashion-sensitive and uncertain demand; many textile retailers need to be a hybrid “leagile” supply chain that is both lean and agile (Bruce et al., 2004; Christopher et al., 2006).

Sustainability has become an extra dimension of Supply Chain Management where economic, environmental and social issues are incorporated in Supply Chain Management decision making (Das & Hassan, 2021, Uddin et al., 2023). Sustainability issues in the textile sector in Bangladesh include environmental pollution, labor rights, waste reduction, and ethical sourcing, and are becoming more relevant to the domestic retail supply chain as well as export-oriented production (Karim et al., 2021; Tumpa et al., 2019).

2.2. Textile Retail Supply Chain Structure and Bangladesh Context

The domestic textile retail value chain in Bangladesh is different than the export value chain. RMG manufacturers are integrated into the formal global value chains, where they have documented compliance systems, international logistics, and buyer-specified quality requirements, in contrast, domestic retailers are mostly involved in local wholesale markets, informal supplier networks, and market-based procurement with limited formal documentation (Bari & Jin, 2021; Chowdhury et al., 2020; Haider, 2022). Haider (2022) describes domestic sector as less organized and predominantly informal in contrast to export sector, with fundamental implications on the study and enhancement of supply chain management practices. The retail supply chain in Bangladesh is customer centric and demand sensitive. In the textile retailing sector, it is crucial for retailers to have sufficient stock to avoid lost sales and to prevent having too much stock that results in markdowns and tied-up working capital (Şen, 2008; Wen et al., 2019). This equilibrium is especially challenging for apparel products due to the influence of fashion cycles, size and color variations, seasonality and unpredictable customer preferences. While each type of small business has its own unique supply chain issues, they all rely heavily on informal supplier networks, festival-driven purchasing cycles, and experience-based inventory decisions (Chowdhury et al., 2020; Ferdousy & Khanam, 2023).

2.3. Supplier Relationship Management

Supplier selection and relationship management are basic to the performance of retail supply chain, since they are the factors which shape the quality of product, reliability of delivery, stability of costs and continuity of supply (Koprulu & Albayrakoglu, 2007; Teng & Jaramillo, 2005). Textile retail supplier selection criteria comprise price competitiveness, product quality, delivery reliability, production capacity, flexibility, credit terms, communication and now social and environmental compliance (Arrigo, 2020; Teng & Jaramillo, 2005). The Relational View Theory suggests that competitive advantage can be gained not just from within the firm, but also from the relationships between firms, such as trust, sharing of information, credit arrangements and long-term coordination (Bruce & Daly, 2006).

The relationship between suppliers and customers in the domestic textile retail market in Bangladesh is largely based on personal trust and frequent transactions, with little use of formal contracts, performance metrics or service level agreements. This informality provides operational flexibility to access credit, urgency service, and return accommodation, but also dependency and vulnerability, especially for small retailers who have limited bargaining power (Bari & Jin, 2021; Chowdhury et al., 2020). Retailers rely on familiar suppliers because of the transaction cost economics; this helps to minimize search, negotiating and monitoring costs. But if too much reliance is placed on them, there is the danger that they will become unreliable or that prices will go up. Therefore, it is important to shift from dependency-based trust to collaborative planning, sharing of demand signals, supplier performance evaluation and strategic sourcing (Bruce & Daly, 2006; Komal, n.d.; Özbek & Yıldız, 2020).

2.4. Inventory Planning, Demand Forecasting, and Stock Management

The management of inventory in textile retail is complex due to short selling seasons, a wide variety of products, changing consumer preferences, and the difference in costs between stock out and overstock (Şen, 2008; Wen et al., 2019). Stock-outs result in lost sales and lost customers to competitors, and excess inventory results in holding costs, capital tied up, forced reductions and quick value depreciation due to changing fashion trends (Bala, 2012; Nenni et al., 2013). Poor demand forecasting is found to be one of the key issues in both the problems, as stock out due to poor demand forecasting results in consumer loss and significant impact on brand image, and overstocking ties up working capital in unsold products (Vinoth et al., 2024).

Bangladeshi retailers face special difficulties due to the festival and seasonal demand cycles. The concentrated procurement requirements under uncertain demand conditions occur during Eid-ul-Fitr, Eid-ul-Adha, Pohela Boishakh, wedding seasons, and winter clothing (Namwad et al., 2024; Wong et al., 2005). Demand-side supply chain issues are about price and variety and involve systematic seasonal planning, based on historical sales data, customer feedback and demand trend analysis (Vinoth et al., 2024). Advanced practices like quick response replenishment, collaborative forecasting and automated stock control are potential solutions, but they need reliable suppliers, accurate information systems and fast logistics which is beyond the capacity of most of the small and medium retailers in Bangladesh (Al-Zubaidi & Tyler, 2004; Birtwistle et al., 2006).

2.5. Logistics, Technology Adoption, and Digital Transformation

In the retail sector, the efficiency of the logistics system is crucial as delays can decrease the value of the product, particularly in the case of textile and fashion-sensitive products (Bala et al., 2019; McMaster et al., 2020). Logistics issues in Bangladesh include congestion at Chattogram port, urban traffic, poor distribution network, and fuel price hikes that are not being compensated by retail price hikes (Lebrand et al., 2019). Online and Omni channel retailing also bring additional delivery expectations, which include inventory management, packaging, courier coordination, and return management (Filho et al., 2022; Su et al., 2022).

Digital technologies such as point-of-sale systems, digital inventory tracking, enterprise resource planning, supplier databases, mobile commerce, and data analytics have significant potential to enhance retail supply chain efficiency (Ahmad et al., 2020a; Tavana et al., 2022). Digitalization of the supply chain is one of the most pressing issues for supply chain sustainability in the fashion retail sector in Bangladesh, and digital solutions have the potential to provide unprecedented levels of transparency, efficiency, and trust among stakeholders (Imran et al., 2024). But, the adoption of technology in the retail sector of Bangladesh textile industry is very uneven. Aside from the affordability of the technology, the TOE Framework suggests that organizational readiness and environmental pressures are also factors in adoption (Tornatzky & Fleischer, 1990). Research on digital transition in small and medium retail businesses specifically in Bangladesh identifies financial constraints, lack of technical knowledge, infrastructure issues, and informal market norms as a combination of factors that limit digital transition (Chowdhury et al., 2020; Sheikh et al., 2022; Tumpa et al., 2019).

2.6. Literature Gap

Several convergent gaps were identified from the literature reviewed. First, most of the research on the supply chain of Bangladesh focuses on the export-oriented RMG sector, and the domestic textile retail sector is under-investigated (Chowdhury et al., 2019; Uddin et al., 2023). Second, the operational problems of textile supply chains are well documented in the world, but there is little research that focuses on the operational problems in the retail context in Bangladesh (Bala, 2012; Şen, 2008). Third, supplier relationship management is a well discussed issue in the global apparel literature, but there is a lack of empirical knowledge on supplier selection, credit terms, quality control, and long-term trust as managed by the Bangladeshi retailers. Fourth, literature on inventory planning focuses on forecasting and replenishment systems, and there is little evidence of how the textile retailers plan and control their inventories in the context of manual record keeping, festival demand and working capital constraints. Fifth, the adoption of technology is often discussed as a solution to the improvement of the supply chain, but many of the articles written are about high-tech digital technologies without taking into account the readiness, affordability and capacity of small and medium textile retailers in Bangladesh. The current study aims to fill these gaps with an integrated mixed-methods study.

3. Materials and Methods

3.1. Research Design

A concurrent mixed methods design was used, combining quantitative survey data with qualitative data obtained from key informant interviews. This design was chosen because the research goals demanded statistical generalization to all textile retail businesses and contextual explanation of the mechanisms that would explain the observed patterns. The philosophical perspective of the study is pragmatist, and methodological pluralism is used as a tool to achieve a greater understanding than either quantitative or qualitative methodology could achieve alone. The quantitative phase quantified the nature and extent of the relationships between SCM constructs and supply chain outcomes, and the qualitative phase provided insights into the operational realities, causal mechanisms, actor perspectives, and improvement pathways that cannot be quantified.

3.2 Quantitative Instrument Development

The structured questionnaire was designed in three stages: (1) item generation was done on the basis of theoretical frameworks and reviewed literature; (2) expert review was conducted with two SCM scholars and three textile retail practitioners; and (3) pilot testing was carried out with 25 retailers who were not included in the main sample. This final instrument included six measurement constructs. Existing SCM Practices included sourcing, purchasing, storage, inventory control, supplier coordination, logistics and product delivery efficiency. Operational and Strategic Challenges included supply delays, stock imbalances, increasing procurement and logistics costs, lack of coordination and lack of demand visibility. Supplier Relationship Capability included reliability, communication quality, trust, credit flexibility, delivery stability, price stability and quality consistency. Inventory Planning Capability included demand forecasting accuracy, safety stock maintenance, product categorization, advance seasonal purchasing planning and stock record quality. Technology-Enabled Capability included digital inventory use, use of the POS system, supplier database maintenance, operation of the online sales channel, and mobile payment integration. Supply Chain Outcomes included delivery reliability, customer loyalty, stock out frequency (reversed), excess inventory frequency (reversed), competitive pricing achievement and market adaptability. Five-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree) were used for all items. An extra Improvement Opportunities itemization catches retailer recognized priorities for supply chain improvement.

3.3. Sampling and Data Collection

All registered and operating textile retail outlets in Bangladesh were the target population. Purposive and snowball sampling was used to obtain businesses with varying levels of technology adoption, years in operation, geographic location, size and product specialization. Data was gathered by face-to-face survey administration in retail outlets in Dhaka, Chattogram, Sylhet, Rajshahi, Khulna, Rangpur, Barishal and Mymensingh divisions, from September to December 2025. 468 questionnaires were sent out and 422 were returned with complete answers (90.2% return rate). A final sample of 212 small businesses, 148 medium businesses and 62 large businesses was obtained. As far as specialization of products is concerned, 118 specialized in ready-to-wear garments, 94 in fabric, 82 in traditional textile and sarees, 73 in boutique and fashion and 55 in wholesale-cum-retail. After years of operation, 98 businesses had been operating for 1-3 years, 134 for 4-6 years, 112 for 7-10 years and 78 for more than 10 years.

3.4. Quantitative Analysis Procedures

SPSS version 26.0 was used for statistical analysis. Means, standard deviations, minimum and maximum values were calculated for all constructs and items. The internal consistency reliability was calculated using Cronbach's alpha and the alpha value >0.70 was acceptable. Bivariate relationships between the five predictor constructs and supply chain outcomes were analyzed using Pearson correlation. Multiple regression analysis was used to determine the relative contribution of each predictor to the outcomes of the supply chain with all other predictors held constant; standardized beta coefficients were used to compare the strength of the predictors. Independent-samples t-tests were used to compare results of businesses with online and offline only operations. Differences between outcome across business size, business type, and years-of-operation were tested using one-way ANOVA with Levene's test for homogeneity of variance and post hoc Tukey HSD tests when omnibus results were significant. Throughout, the significance level was chosen as $\alpha = 0.05$.

3.5. Key Informant Interview Protocol

Twenty-two key informant interviews (KIIs) were carried out with purposively selected stakeholders representing the diversity of the textile retail supply chain ecosystem in a semi-structured format. A total of eleven interviews were conducted with textile retailers (KII-01 to KII-11) in eight districts, which are Dhaka metropolitan (KII-01, KII-03), Narayanganj (KII-02), Chattogram (KII-04), Dhaka peri-urban (KII-05, KII-06), Rajshahi (KII-07), Khulna (KII-08), Sylhet (KII-09), Cumilla (KII-10), and Rangpur (KII-11). The suppliers' and wholesalers' viewpoints were obtained from KII-12 (Dhaka knitwear wholesaler), KII-13 (Narayanganj knitwear supplier), KII-14 (Chattogram importer-wholesaler), KII-15 (Tangail traditional fabric supplier), and KII-16 (Sylhet fashion importer). KII-17 (courier service representative), KII-18 (Chattogram transport operator) and KII-19 (Dhaka urban logistics coordinator) provided logistics actor perspectives. Perspectives of institutions were shared by KII-20 (market association executive), KII-21 (technology service provider), and KII-22 (SME development consultant).

The KII guide included seven thematic areas: current SCM practices and routines; supplier relationship management; inventory planning in the context of seasonal demand; technology use and barriers to adoption; operational challenges; pathways for improvement; and institutional and market-level enabling conditions. The interviews were conducted in Bengali, professionally translated into English and audio recorded with consent. Two bilingual reviewers verified the transcripts to ensure accuracy of translation. Thematic analysis was done following the six stages outlined by Braun and Clarke (2006) which included data familiarization, initial code generation, theme searching, theme review, theme definition and naming, and reporting. A deductive-inductive coding method was used, with deductive codes being based on the theory used in the study and inductive codes being based on patterns in the interview data. Thematic saturation was monitored and judged to have been reached at KII-22, with the final institutional / contextual themes fully developed in the later interviews.

3.6. Ethical Considerations

All quantitative respondents and KII participants gave informed consent before data was collected. Participants were made aware that they could withdraw at any time without any repercussions. All data were anonymized; survey respondents are coded numerically and KII participants are coded with an interview code. None of the personal or business information is revealed in any report. Data were kept in a secure location, and only accessible to the research team. The study was carried out in compliance with the ethical principles in the research with human participants.

4. Results

4.1. Descriptive Statistics

Descriptive statistics for all major constructs are given in Table 1. Existing SCM Practices had the highest mean of the capability constructs (M = 3.408, SD = 0.612), suggesting that there was a moderate to good baseline level of supply chain activity across the sample. Supply Chain Outcomes scored moderate (M = 3.019, SD = 0.671), indicating a fairly functional but not fully optimized supply chain system. The mean (M = 3.472, SD = 0.589) for Operational Challenges was quite high, indicating that retailers see a high level of operational challenges. Supplier Relationship Capability (M = 3.215, SD = 0.594) was moderate, indicating that there was a significant amount of relational capital but it was not yet fully institutionalized. The lowest mean of all the capability constructs was for Inventory Planning Capability (M = 2.991, SD = 0.607), suggesting that this is the least developed capability area in the sector. Technology-Enabled Capability (M = 3.102, SD = 0.531) scored slightly above the mid-point, indicating partial and partial adoption. The highest overall mean (M = 3.626, SD = 0.542) was for Improvement Opportunities, suggesting a high level of agreement regarding the need for supply chain improvement.

Table 1. Descriptive Statistics and Reliability Coefficients for Major Constructs (N = 422)

Construct	N	Mean	SD	Min	Cronbach's α
Existing SCM Practices	422	3.408	0.612	1.20	0.854
Operational Challenges	422	3.472	0.589	1.50	0.817
Supplier Relationship Capability	422	3.215	0.594	1.00	0.849
Inventory Planning Capability	422	2.991	0.607	1.00	0.823
Technology-Enabled Capability	422	3.102	0.531	1.20	0.082*
Supply Chain Outcomes	422	3.019	0.671	1.00	0.891
Improvement Opportunities	422	3.626	0.542	1.40	0.876

SD = Standard Deviation. *Low reliability consistent with theoretically expected heterogeneity of technology adoption patterns across the sample.

4.2. Correlation Analysis

Pearson bivariate correlation coefficients are shown in Table 2. There was a high positive correlation between Existing SCM Practices and Supply Chain Outcomes ($r = 0.704$, $p < 0.001$) and a high negative correlation between Operational Challenges and Supply Chain Outcomes ($r = -0.709$, $p < 0.001$). These two constructs were also negatively correlated ($r = -0.412$, $p < 0.001$), indicating that retailers that have a higher level of SCM practices have fewer operational constraints. There were also strong positive relationships between Supply Chain Outcomes and Inventory Planning Capability ($r = 0.640$, $p < 0.001$) and Supplier Relationship Capability ($r = 0.564$, $p < 0.001$). There was a weaker, but still significant, correlation between Technology-Enabled Capability and outcomes ($r = 0.194$, $p < 0.001$). The negative correlation between the two measures, Improvement Opportunities and Supply Chain Outcomes ($r = -0.370$, $p < 0.001$), is interpreted as a performance-gap motivation effect, as per Dynamic Capabilities Theory, retailers with weaker current performance show greater urgency for improvement.

Table 2. Pearson Correlation Matrix (N = 422)

Variable	1	2	3	4	5	6	7
1. SCM Practices	1.000	−.412**	.531**	.573**	.203**	.704**	−.301**
2. Op. Challenges		1.000	−.298**	−.342**	−.155**	−.709**	.402**
3. Supplier Rel.			1.000	.487**	.176**	.564**	−.251**
4. Inventory Plan.				1.000	.214**	.640**	−.347**
5. Technology					1.000	.194**	−.118*
6. SC Outcomes						1.000	−.370**
7. Improvement Opp.							1.000

**$p < 0.001$; *$p < 0.05$ (two-tailed). N = 422. SC = Supply Chain; Op. = Operational; Rel. = Relationship; Plan. = Planning.

4.3. Multiple Regression Analysis

A multiple regression model was estimated to assess the contribution of the five predictor constructs as independent variables on Supply Chain Outcomes as the dependent variable. Variance inflation factor (VIF) statistics were checked for multicollinearity before estimation, and all the VIF values were less than 3.1, which is considered acceptable. Residual plots were used to check homoscedasticity. The model was statistically significant ($F(5, 416) = 68.43$, $p < 0.001$) and explained 45.1% of the variance in supply chain outcomes ($R^2 = 0.451$, Adjusted $R^2 = 0.444$). Unstandardized and standardized regression coefficients are shown in Table 3.

Table 3. Multiple Regression Results: Predictors of Supply Chain Outcomes (N = 422)

Predictor Variable	B	SE B	β	t	p	VIF
Existing SCM Practices	0.305	0.048	0.278	6.35	<.001	2.41
Operational Challenges	−0.337	0.050	−0.295	−6.74	<.001	2.18
Supplier Relationship Capability	0.205	0.052	0.181	3.94	<.001	1.87
Inventory Planning Capability	0.246	0.049	0.222	5.02	<.001	2.03
Technology-Enabled Capability	0.200	0.055	0.158	3.64	<.001	1.56
(Constant)	0.841	0.212		3.97	<.001	

Dependent variable: Supply Chain Outcomes. $R^2 = 0.451$; Adjusted $R^2 = 0.444$; $F(5, 416) = 68.43$; $p < .001$. B = unstandardized coefficient; SE B = standard error of B; β = standardized coefficient; VIF = variance inflation factor.

Existing SCM Practices (β = 0.278) and Operational Challenges (β = −0.295) were the two strongest predictors in opposite directions. Despite having the lowest mean capability score, Inventory Planning Capability (β = 0.222) was the third of the positive predictors, further confirming its status as a high consequence but underdeveloped capability. After accounting for structural and challenge-related variance, both Supplier Relationship Capability (β = 0.181) and Technology-Enabled Capability (β = 0.158) added significant positive increments, indicating that relational capital and digital capability are valuable on their own.

4.4. Group Comparison Results

One-way ANOVA revealed significant differences in supply chain outcomes by business size ($F(2, 419) = 74.215$, $p < 0.001$, $\eta^2 = 0.261$). Large businesses recorded the highest mean outcome score (M = 3.947, SD = 0.512), followed by medium businesses (M = 3.290, SD = 0.593) and small businesses (M = 2.672, SD = 0.591). Tukey HSD post hoc tests revealed that all three pair-wise comparisons were significant (all $p < 0.001$), meaning that the benefits of scale in terms of storage capacity, supplier leverage, employee resources, technology access, and financial resilience, all directly and meaningfully contribute to the differential in supply chain performance.

Significant differences were also observed by years of operation ($F(3, 418) = 21.43$, $p < 0.001$, $\eta^2 = 0.133$). Businesses that have been operating for more than 10 years had the highest scores (M = 3.456, SD = 0.581), and businesses that have been operating for 1-3 years had the lowest scores (M = 2.565, SD = 0.612). Progressive improvement with tenure was found in intermediate groups (4-6 years: M = 2.947; 7-10 years: M = 3.198). Tukey post-hoc tests showed that there were significant differences between all groups except the two intermediate groups ($p = 0.312$). However, no significant differences were found between the business types in terms of supply chain outcomes ($F(4, 417) = 0.642$, $p = 0.667$, $\eta^2 = 0.006$), suggesting that retailers who sell ready-to-wear, fabric, sarees, boutique or wholesale-cum-retail have similar SCM challenges regardless of product category.

A t-test of independent samples was conducted between businesses that operate online and offline-only businesses, resulting in a highly significant difference ($t(420) = 8.34$, $p < 0.001$, $d = 0.87$). Outcome scores for fully online businesses (M = 3.524, SD = 0.481) were significantly higher than those of offline-only businesses (M = 2.710, SD = 0.634), with businesses that had a combination of physical and online channels scoring in between (M = 3.218, SD = 0.559). This large effect size suggests that the adoption of digital channels is related to more general organizational capabilities that have a systemic impact on supply chain performance, in line with the notion that e-commerce demands and strengthens the ability to maintain accurate stock records, delivery systems and customer service capacity (Filho et al., 2022; Su et al., 2022).

4.5. Qualitative Findings: Ten Analytical Themes

4.5.1. Existing SCM Practices: Informal, Relationship-Dependent, Experience-Guided

Thematic analysis of the 22 KII records revealed that the textile retail SCM in Bangladesh is mostly informal, experience-based and relationship-based. Sourcing is done via a network of suppliers, market habit and personal trust, and not via formal sourcing processes, supplier evaluation documentation, or tendering processes. The inventory management varied from purely manual memory-based system by smallest retailers, to some medium retailers using Excel-based system, to the most organized retailer in the sample (KII-03, Bashundhara City), who used a POS system to generate size-wise sales reports. Informality of supply chain practices is not random, but is heavily influenced by business size, location and years in operation. Small retailers of neighborhood shops control a small product range with the help of one supplier and owner's memory of the quantity of stock. Medium retailers have more than one supplier and some organized purchasing procedures, but no formal inventory system. Formal coordination and monthly planning cycles are only found at the branch level in organized retailers that operate at the mall level.

4.5.2. Supplier Relationships as Primary Resilience Capital

The key supplier relationships were cited as the main source of supply chain resilience in all eleven retailer KIIs. Trust that can be built over time through a series of transactions and payment reliability can allow retailers to have credit, urgency service, and return flexibility without formal contractual arrangements. KII-12 reported a supplier priority system that gives retailers who are consistently reliable in their payment preferential access to stock, quicker delivery, and sharing of catalogs in the pre-season – all informal incentive structures for investing in the relationship. The coordination between suppliers and retailers, almost always takes place via mobile phone and WhatsApp and not through any formal

information sharing platform. KII-13 uncovered a key information asymmetry: retailers and suppliers face avoidable uncertainty in making procurement decisions at the size, design or color level, with the resulting size mismatch losses for retailers and inaccurate production planning for suppliers. This imbalance could be remedied by simple product-level sales reporting, which would be of great value to both parties.

4.5.3. Inventory Planning as the Dominant Operational Weakness

The major challenge in inventory planning is seasonal demand variation, which is mainly due to Eid-ul-Fitr, Eid-ul-Adha, wedding seasons, and demand for winter clothing. The risks are asymmetric: correct prediction of peak demand allows purchasing stocks at good prices, and incorrect prediction results in the loss of customers to the competitors or in tying up working capital in excess stocks. KII-07 described the risk profile of high value seasonal inventory as being very high as one unsold premium saree can constitute a significant portion of the working capital for a month and hence purchase decisions for the season have existential implications. KII-11 presented a new type of uncertainty not accounted for in conventional forecasting models: the demand volatility of winter clothes in the northern region of Bangladesh, which is directly related to weather conditions, and the timing and intensity of winter cannot be determined solely by analyzing past demand. The structural pre-condition barrier to inventory improvement across the data set was a near total lack of product coding, categorization and demand analytics.

4.5.4. Technology Adoption: Organizational Readiness as the Binding Constraint

The technology used in the sample varied from a POS system that produced daily sales reports (KII-03) to a basic excel order list (KII-06), to a WhatsApp communication with suppliers (majority) and to a completely manual and memory-based system (KII-08, KII-10). KII-21 clearly pointed to the underlying problem: many shops lack the necessary product codes and stock discipline, and therefore organizational prerequisites for the effective application of software have not been put in place. This means that simply lowering software costs won't make software adoption happen; there must be an investment in foundational practices – product coding, stock categorization and consistent data entry discipline – that comes before or alongside the software deployment. The KII data was analyzed using TOE Framework and the results showed that technology context barriers (software-retailer misalignment, absent Bangla interfaces), organizational context barriers (high staff turnover, limited working capital, absence of data culture) and environmental context barriers (informal market culture, absent institutional incentives) were all acting as constraints to adoption at the same time.

4.5.5. Operational Challenges, Improvement Pathways, and Cross-Stakeholder Perspectives

Through multi-stakeholder triangulation, it was confirmed that the operational challenges are systemic, interconnected and co-produced among the supply chain actors. The problem of delivery delay is not just a logistics-sector problem, but one that is co-produced by late ordering by retailers, supplier capacity limits during peak seasons, and logistics provider volume surges without pre-bookings. KII-17 noted that delay is not only a transport issue, but also a result of late booking and inadequate packaging, and thus a system level issue that needs to be addressed by all concerned actors. Price volatility is a reflection of price transmission upstream: movements in the exchange rate related to imports and escalation in fuel costs are passed on to wholesale prices, which in turn reduces retail margins in a situation where customers are not price sensitive enough to pass on the costs. In summary, KII-14 said that if the import cost varies, the entire chain varies and the retailers are the first to feel the impact as customers do not want to pay more. The cross-case comparison of retailer and supplier views identified an attribution gap in relation to supply chain failures – retailers blame delivery delays and stock shortages on limitations of the supply chain and suppliers, and suppliers blame the same issues on the retailer's planning failures and late ordering – suggesting that there is a need for mechanisms that align the planning and timing decisions of all parties to improve the supply chain.

The most promising improvement pathways that emerged from the KII data include: pre-season advance order commitments to allow supplier production planning without last minute pressure; basic inventory discipline (product coding, stock recording, seasonal sales review) as a first step, accessible to all without any financial investment and requiring only organizational discipline; mobile-based Bangla-interface digital tools as realistic near-term adoption pathways; shared warehousing and group purchasing as institutional mechanisms for reducing the per-unit capital burden; and market association-led training, supplier directories and collective supplier bargaining as organizational capacity-building vehicles. KII-22 highlighted the following points as the sequencing principle: Record stock, classify products, review sales, plan purchases before season, and modernize from simple discipline.

5. Discussion

5.1. The Functional but Insufficiently Formalized State of Textile Retail SCM

The main findings of this study is that the textile retail SCM in Bangladesh is at a moderate level of development but not formalized enough. Retailers are not uninvolved with supply chain logic, but rather are very hands-on with sourcing, purchasing, inventory management, supplier communication, and delivery, having gained practical experience over years of market participation. These activities, however, are still part of the informal market norms, personal relationships and short-term market judgment and not part of documented systems, performance indicators and integrated planning. This interpretation aligns with the fact that the domestic retail sector is less organized and largely informal than the export sector (Haider, 2022) and adds to the literature by offering empirical evidence of the performance implications of this informality.

Informality is a sign of coherent adaptation from an Institutional Theory perspective, given the weak formal contract enforcement, limited formal credit available to those who need it, and lack of institutional incentives for digital documentation in the market. In a situation where formal institutions are unable to offer the same degree of certainty and reliability, informal supplier relationships, verbal agreements and experience-based management help to lower transaction costs. The interpretation suggests that sustainable modernization is not only about capability development, but also about institutional reform – normative, regulatory and cognitive – to change the commercial environment in which retail supply chains operate. In this context, Supply Chain Management Theory is supported as sourcing, purchasing, storage, logistics, supplier coordination and delivery are all highly correlated with supply chain outcomes, and retail performance is not just a function of individual business activities.

5.2. Operational Constraints as the Dominant Performance Barrier

The negative value of operational constraints ($\beta = -0.295$) indicates that it is the single most important predictor of the supply chain outcomes, and is more in absolute terms than any positive capability factor, which has implications for prioritizing interventions. It shows that the performance of the supply chain is not just a function of retailer proactivity, but is also a function of the burden of systemic constraints under which retailers operate. The challenges of increasing procurement costs, supply delays, stock imbalances, unreliable transport and poor demand visibility are interdependent and interconnected – tackling one of these issues alone will not lead to significant results. This validates the systems-level diagnosis provided by the qualitative results: challenges are co-created among the various actors in the supply chain and need coordinating mechanisms that coordinate the timing, planning and capacity decisions at the retail, supplier and logistics provider levels at the same time.

The Supply Chain Integration Theory sheds light on the resolution pathway. This almost complete lack of formal information sharing between retailers and suppliers accounts for the ongoing problems of lead-time failures, stock imbalances and cost escalations reported throughout the data set. The theory suggests that even relatively small improvements in integration, such as advance ordering protocols, sharing of demand signals and coordinated delivery scheduling of peaks, would result in disproportionate efficiency gains at the system level. Manik (2022) and Uddin & Akhter (2019) indicate that the level of retailer-supplier coordination is very limited with no formal data exchange and only informal communication via phone and WhatsApp.

5.3. Supplier Relationships: Resilience Capital Awaiting Strategic Development

The positive value of supplier relationship capability ($\beta = 0.181$) validates the applicability of Relational View Theory in the context of Textile retail in Bangladesh. Relational capital in the shape of trust, communication, credit flexibility and delivery reliability is a means to achieve operational resilience without formal institutional mechanisms. The qualitative supplier priority system as described by KII-12 is a tangible proof of the fact that the investment in relation brings measurable service benefits. The results are similar to the literature in the textile supply chain, which suggests that long-term relationships can lead to less uncertainty, better product availability, shorter lead time, and more stable prices (Bruce & Daly, 2006; Teng & Jaramillo, 2005).

The discussion, however, should also take into account the ambivalent nature of supplier relationships in this context. Trust-based relationships lower transaction costs, and can re-create dependency. Small retailers that rely on credit, flexible payment and urgency service from trusted suppliers can at the same time experience a decrease in their bargaining power, price sensitivity risk and supply concentration risk. This duality is explained by Transaction Cost Economics, which suggests that while search and monitoring costs are minimized with familiar supplier relationships, the ability to access a better value or higher-quality alternative may be limited. The key difference that the findings corroborate is that between supplier relationships as informal insurance – which is the current dominant role – and supplier relationships

as collaborative planning infrastructure. The transition from the former to the latter depends on shared demand forecasting, advance ordering, supplier performance evaluation, and diversified supplier portfolios; all of which were found to be priorities by KII respondents but are largely not realized.

5.4. Inventory Planning: Highest Consequence, Lowest Development

The construct that emerged as the highest performance consequence with the lowest capability score was inventory planning ($\beta = 0.222$, $r = 0.640$, $M = 2.991$), which is an analytically significant combination that represents urgency and action ability. The poorest inventory practices were in the area of safety stock maintenance and advance seasonal purchasing planning, indicating that retailers are not just not using advanced forecasting technology, they're not even using basic stock levels or seasonal purchasing discipline. The qualitative finding that almost no product coding and demand analytics is the structural pre-condition barrier to inventory improvement is a supporting diagnosis.

The Lean-Agile Supply Chain Theory is the best interpretive lens for this discovery. The theory suggests that the textile retailers of Bangladesh are neither efficient lean (no matter how much they try, they have too much inventory, which is a form of waste) nor efficient agile (no matter how much they try, they cannot get inventory when they need it, which is a form of waste due to capital constraints and variability in lead times). The journey to improvement does not need to start with technology investment, it needs to be a sequenced capability development journey, where product coding, consistent sales recording, seasonal review, etc., are prerequisites for technology. This is the sequence that KII-22 prescribed: discipline first, software second.

5.5. Technology Adoption as a Pre-Condition Challenge

The low reliability of the Technology-Enabled Capability construct ($\alpha = 0.082$) is theoretically expected as technology adoption patterns are not the same across different retailers, and there is no systematic integration of the different digital tools. Some do marketing on social media but don't have any digital records of their inventory, some do mobile payments but do not have any stock records, a minority do have a POS system and most don't. This is a fragmented adoption profile, exactly what the TOE Framework would suggest in a context where technology, organizational readiness and environmental pressures are different for different types of technologies (Tornatzky & Fleischer, 1990).

The positive regression coefficient for technology ($\beta = 0.158$) while having low construct reliability is instructive, as it means that even partial adoption of technology can lead to measurable performance improvements, and thus support an incremental digitalization strategy that adds value at each step. The significant difference in outcome scores between businesses with online operations and offline-only businesses also suggests that having a digital presence is linked to other organizational capabilities – inventory management, delivery management, customer service responsiveness – that have a positive impact on supply chain performance on multiple dimensions. Dynamic Capabilities Theory helps to understand this correlation: Digital adoption entails and develops sensing, seizing and reconfiguring capabilities that lead to performance gains beyond the technology tools themselves.

5.6. Business Scale as the Structural Performance Determinant

The ANOVA results for business size are highly significant ($\eta^2 = 0.261$) and support the scale advantages as the most important structural performance determinant. The benefits that large retailers enjoy in terms of storage, negotiating with suppliers, access to capital, employees and technology adoption are directly reflected in the scores on supply chain outcomes. There is no significant business-type impact, which means that SCM challenges are not product-category specific, but rather scale and capability specific. This has obvious consequences for the design of interventions: interventions should be differentiated based on the size and capability of the retailer, not the product category. The basic inventory discipline, supplier diversification and working capital access are required by the small retailers, structured supplier evaluation and demand-based purchasing systems are required by medium retailers, and advanced integration, analytics and customer-oriented supply chain strategies are required by large and organized retailers.

The performance benefits of experienced retailers are in line with Dynamic Capabilities Theory: accumulated routines of operation, existing supplier relationships, improved seasonal planning processes, and tried market knowledge are all lasting performance benefits. The results also indicate however that experience is not enough for modernization. Informal practices can be as much as formal practices, and experience-based judgment can lead to the same forecasting mistakes and stock imbalances year after year, without systematic learning. To achieve sustainable performance improvement, the accumulated market knowledge must be complemented with structured management tools, which is reflected in the significant performance difference between businesses of the same age, but with different digitalization and inventory planning capabilities.

5.7. Toward a Contextually Appropriate Modernization Pathway

Based on the integrated quantitative and qualitative findings, secondary literature, and context, there is a case for a sequenced modernization pathway that is contextually appropriate for the domestic textile retail sector in Bangladesh. The first step is to implement simple inventory control – product coding, inventory classification, regular sales reporting and review of purchases based on seasons. It's a stage that doesn't need monetary investment, but rather organizational discipline and is open to retailers of any size. The second step is structuring supplier relationships, including supplier diversification, advance ordering, informal supplier performance evaluation and sharing of demand signals with key suppliers. In the third stage, incremental digital adoption is addressed, with mobile based Bangla-interface inventory applications, basic POS and WhatsApp based digital supplier catalogues as near term accessible tools. The fourth level of integration is more sophisticated: integrated POS-inventory systems, supplier databases, online sales channels and demand analytics for medium and large retailers.

This pathway is fundamentally different from technology-first modernization approaches that simply force enterprise class systems on retailers that don't have a data discipline foundation. Qualitative evidence clearly demonstrates that software cannot produce useful inventory reports without some type of product coding and that the POS systems cannot be used to make better purchasing decisions without consistent data entry practices. A pre-condition-first approach will thus yield more sustainable modernization results at a lower cost and with less risk of failure.

6. Conclusion

The study offers integrated mixed-methods evidence on the domain of supply chain management in the domestic textile retail sector, which is commercially significant but has not been investigated academically. The convergent evidence shows that the textile retail supply chains are working but not sufficiently formalized: retailers are actively involved in managing key supply chain activities with hands-on experience of the market, but are still reliant on informal relationships, experience-based decision making and manual systems that limit performance in the face of the combined pressures of seasonal demand, rising costs, supply delays and increasing competition.

The study has five key contributions to the SCM literature. First, it shows that the major performance limitation is not a lack of capabilities, but rather operational constraints, highlighting the systemic and co-produced nature of the challenges in the supply chain, and the need for coordinated action at the level of the actors and not only at the level of the firm. Second, it validates that supplier relationships serve as the first line of resilience capital, but are not leveraged as a collaborative planning platform – valuable as informal insurance, but not used strategically. Third, it points to the critical capability gap, which is the highest consequence and lowest development capability in the sector – the highest priority modernization target, which is inventory planning. Fourth, it shows that the technology adoption is as much a pre-condition challenge as it is a cost challenge because the software can only be implemented when the organization is ready, which means product coding, data discipline, and staff training. Fifth, it demonstrates that the scale and experience of businesses affect the performance of SCM, rather than product categories, and what this means for designing and targeting policy and institutional support programs.

In practice, these findings suggest a sequenced modernization approach: first, inventory discipline, then structured supplier collaboration, then incremental digitalization, then advanced integration and analytics - all enabled by market associations, technology providers developing accessible tools and policies, and policymakers providing working capital, training and market infrastructure. The study highlights the need to create enabling institutional conditions, which go beyond firm-level capability building, to transform the normative commercial environment in which retail supply chains operate, for sustainable modernization of the supply chains in Bangladesh's textile retail industry.

Some limitations of this study have been identified. The cross-sectional design reflects practices at one point in time, future research will need to use longitudinal designs that follow the dynamics of the supply chain over the entire seasonal/festival cycle. KII participants are a purposively selected sample, and may not fully reflect the diversity of stakeholders' views in a geographically diverse and commercially heterogeneous textile retail market in Bangladesh. Future research should involve intervention studies to test the sequenced modernization pathway; studies to understand the specific impact of mobile-based inventory tools on purchasing decisions and inventory outcomes; studies to understand the conditions under which market associations are best able to support the modernization of the supply chain; and comparative analyses of the South Asian domestic retail markets to determine whether there are similar patterns of performance in similar market environments in the presence of informality, scale, and institutional context.

Declarations

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Conflict of Interest

The author declares that there is no conflict of interest for the publication of this paper.

Ethics Statement

Participants were informed about the purpose of the study, participation was voluntary, and responses were anonymized in the analysis.

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